SEAT CARRIER FOR A CHAIR, IN PARTICULAR OFFICE CHAIR

BACKGROUND OF THE INVENTION

Field of the Invention

The invention relates to a seat carrier for a chair, in particular office chair, comprising an adjustable-length, blockable gas spring which is mounted by an end on a supporting frame; a valve actuation rod, which is extended out of the gas spring parallel to a longitudinal axis thereof and mounted for pivoting crosswise of its longitudinal direction and which is pivotable from a position of rest into an open position of a valve for release of blockage of the gas spring.

Background Art

A seat carrier of the generic type has been disclosed by prior public use. A blockable gas spring that can be used in a seat carrier of the generic type has been described in US 5 915 674 A. Operating such a gas spring has so far been comparatively complicated, for example by the aid of a Bowden cable as described in DE 298 11 639 U1.

SUMMARY OF THE INVENTION

It is an object of the present invention to further develop a seat carrier of the type mentioned at the outset for simplified operation of the gas spring.

According to the invention, this object is attained by the features wherein a lever element is provided for operation of the valve actuation rod; wherein

the lever element is articulated to the supporting frame via a pivot joint that is parallel to the longitudinal axis of the gas spring; wherein the lever element comprises a valve-actuation-rod entrainer which is laterally spaced from the pivot joint; wherein the lever element comprises at least one lever arm, the end of which is spaced from the pivot joint; and wherein the lever element is connected to an operating element.

Operating the valve actuation rod of the gas spring by way of the lever element according to the invention can be designed such that the force for operating the valve actuation rod will be further reduced. In this case, the lever arm is long as compared to the lateral distance of the entrainer from the pivot joint. The lever arm can be linked to the operating element by a corresponding mechanical coupler so that the operating element can be arranged ergonomically. As a whole, the lever element according to the invention can be manufactured at a low cost. In keeping with a first alternative, the lever element may be designed in such a way that the entrainer is disposed between the pivot axis and the free end of the lever arm, or, in a second alternative, the pivot axis can be disposed between the entrainer and the lever arm. Which of the two alternatives to select depends on the respective requirements for leverage and space.

A restoring element that pre-loads the lever element in the position of rest of the valve actuation rod prevents the blockage of the gas spring from being released inadvertently. In the simplest of cases, the valve actuation rod itself returning automatically into the position of rest will constitute the restoring element. If the valve actuation rod does not have any proper restoring force for returning into the position of rest or if this restoring force is not sufficient upon operation of the gas spring for example for reasons of

operational safety, provision can be made for a restoring element outside the gas spring.

A restoring element which is formed by at least one helical spring can be provided at a low cost.

The lever element has two lever arms which are long as compared to the lateral distance of the entrainer from the pivot joint and the ends of which that are spaced from the pivot joint are connected to respective operating elements; this offers the possibility of operation at a low operating force.

An embodiment, wherein the lever element has the shape of a majuscule T in mirror symmetry to a central plane of the lever element where the longitudinal axes of the pivot joint and the valve actuation rod are located in the position of rest, will reduce manufacturing requirements.

When the entrainer is a drill hole in the lever element, with the valve actuation rod inserted therein, this ensures implementation at a low cost.

When the entrainer is an oblong hole in the lever element which extends crosswise of the motion of dislocation of the valve actuation rod and in which is guided the valve actuation rod, this offers the possibility of implementing any motion of dislocation of the valve actuation rod between the position of rest and the open position as a linear motion. This reduces the load on the valve actuation rod upon dislocation and reduces the risk of jamming.

A clever possibility of operating the gas spring by an operating element in the vicinity of the armrest resides in that the at least one operating element

is disposed in vicinity to an arm pad which is joined to the supporting frame by an arm pad support, with a connecting arrangement, which connects the end, spaced from the pivot joint, of the lever arm of the lever element to the operating element, being formed by a mechanical coupler, which is guided in the arm pad support.

The operating elements projecting over the supporting frame preferably on two opposite sides, this symmetrical arrangement enables operation to be equally convenient for right-handers and left-handers.

Details of the invention will become apparent from the ensuing description of embodiments of the invention, taken in conjunction with the drawing.

BRIEF DESCRIPTION OF THE DRAWING

Fig. 1 is a plan view of a seat carrier according to the invention;

Fig. 2 is a sectional view, partly broken away, on the line II-II of Fig. 1;

Fig. 3 is a plan view, partly broken away, of the seat carrier by analogy to Fig. 1, illustrating a lever element in a position for opening;

Fig. 4 is an illustration, partly broken away, of a second embodiment of a lever element on an enlarged scale and by analogy to Fig. 3; and

Fig. 5 is an illustration of a third embodiment of a lever element in a sectional view on the line V-V by analogy to Fig. 1.

DESCRIPTION OF PREFERRED EMBODIMENTS

A seat carrier seen in Fig. 1, which is designated in its entirety by 1, comprises a central, horizontal supporting plate 2 which constitutes a supporting frame. This plate 2 has a central hole 3 seen in Fig. 2 where the upper end of a piston rod 4 of a blockable gas spring 5 is fixed, which connects the supporting plate 2 to a five-branch pedestal 7 that is rotatable about a longitudinal axis 6 of the gas spring 5.

A valve actuation rod 8 is guided centrally in the piston rod 4. This rod 8 can be pivoted crosswise of its longitudinal direction between a position of rest seen in Figs. 1 and 2 and an open position seen in Fig. 3, in which the blockage of the gas spring 5 is released. An end of the valve actuation rod 8 is extended upwards out of the gas spring 5 and inserted in an entrainer hole 9 of a lever element 10. As seen in Fig. 1, it has the shape of an upside down majuscule T. At the root of this T, the lever element 10 is articulated to the supporting plate 2 by way of a pivot joint 11 that forms an axial/radial bearing for the lever element 10. The pivot joint 11 has a vertical pivot axis 12 which runs parallel to the longitudinal axis 6 and is laterally adjacent thereto.

The roof of the T of the lever element 10 constitutes a continuous actuation rod 13 which cooperates with a flat section 14 that is the foot of the T, forming the lever element 10. The actuation rod 13 is fixed to the flat section 14 by two screws 15. The free ends of the actuation rod 13 are equipped with operating handles 16 which project over the supporting plate on opposite sides.

Two bearing blocks 17, 18 are fixed on both sides of the flat section 14 on an end portion, turned towards the actuation rod 13, of the supporting plate 2. Horizontal helical springs 19, 20 support themselves between a respective bearing block 17, 18 and the flat section 14. The helical springs 19, 20 pre-load the lever element 10 in the position of rest of the valve actuation rod 8.

Fig. 3 illustrates the flat section 14 of the lever element 10 in a position for opening, in which the valve actuation rod 8 that is fixed in the entrainer hole 9 is moved from the position of rest according to Fig. 1 into the open position. In the open position, the gas spring 5, and thus the supporting plate 1, can be adjusted in height relative to the pedestal 7.

Dislocation of the lever element 10 according to Fig. 3 takes place against the restoring force of the helical spring 19. Correspondingly symmetrical dislocation into a position for opening is possible in a direction towards the helical spring 20.

Figs. 4 and 5 illustrate further embodiments of the invention. Components that correspond to those described with reference to Figs. 1 to 3 have the same reference numerals and details will not be explained once again.

Fig. 4 illustrates a variant of a flat section 14 of the lever element 10 on an enlarged scale. Provision is made for an oblong entrainer hole 21 instead of the entrainer hole 9 of the first embodiment. In the lever element 10 of Fig. 4, the valve actuation rod 8, upon dislocation from the position of rest into the open position, does not move on a path in the shape of a segment of a circle, but linearly, with the valve actuation rod 8 shifting in the longitudinal direction of the entrainer hole 21.

Fig. 5 illustrates a third embodiment. The lever element 10, which otherwise corresponds to that of Fig. 1, is connected to an armrest 25, which is joined to the supporting plate 2 in a manner not shown, via a mechanical coupler 22 with an operating button 23 underneath an arm pad 24. The armrest 25 comprises an arm pad support 26 in addition to the arm pad 24.

The mechanical coupler 22 comprises a coupling pin 27 that is fixed on the top of the flat section 14 of the lever element 10. The free end of the coupling pin 27 is received in an entrainer hole 28 that is provided in a first horizontal coupling link 29 which is joined to a second coupling link 31 via a pivot joint 30. The end, turned away from the pivot joint 30, of the second coupling link 31 bears against the operating button 23. The two coupling links 29, 31 are guided within the hollow arm pad support 26. The second coupling link 31 is a symmetric lever, pivotable about a central lever axis which is perpendicular to the plane of projection of Fig. 5 and given by a lever joint 32 that is tightly connected to the arm pad support 26.

The mechanical coupler 22 between the operating button 23 and the lever element 10 works as follows: When the operating button 23 is pressed, the opposite end of the second coupling link 31, which incorporates the pivot joint 30, is deflected to the right in Fig. 5. In doing so, the first coupling link 29, together with the coupling pin 27 and the flat section 14, is also deflected to the right in Fig. 5, taking a position for opening corresponding to Fig. 3. Consequently, the valve actuation rod 8 is transferred by pressure on the operating button 23 from the position of rest into the open position for release of blockage of the gas spring 5.